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(54) Cosmetics comprising an n-acylamino acid ester

(57) There are disclosed cosmetics which comprise esters of N-acylamino acids containing acyl groups having odd-numbered carbon atoms, and esters of N-acylamino acids containing acyl groups having carbon atoms in an odd number in the range of 13 to 17. The above esters are used for the foregoing cosmetics, which have excellent hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action, etc. and thus are well suited for hair growth, skin care and the like.

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Description

The present invention relates to cosmetics such as hair growth agents and hair grooming agents. More particularly, it pertains to cosmetics which have an excellent hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action and the like and thus are well suited for hair growth, skin care and the like.

Cosmetics blended with various effective drugs have heretofore been known. For example, a hair growth agent is incorporated with, as an effective drug, a vitamin such as vitamin E; a vasodilator such as acetylcholine derivatives; an antiflammatory agent such as lithospermum root extract; female sex hormone such as elastodiol; a skin function enhancing agent such as cepharanthine; a melanin synthesis catalyst such as copper pantothenate; a keratolytics such as salicylic acid; and the like, said hair growth agent being used for the prevention and therapy of alopecia.

As an example in which a fatty acid or a derivative thereof is blended in cosmetics such as a hair growth agent, an example is known in which a natural vegetable oil such as olive oil or castor oil or stearic acid is blended for the purpose of improving the physical properties of a product. It is known that almost all of fatty acids which constitute various lipids of natural origin such as vegetable oils and animal oils are fatty acids having even-numbered carbon atoms chain, whether the fatty acid is a saturated one such as stearic acid, palmitic acid, etc, or an unsaturated fatty acid such as oleic acid, linolenic acid, etc.

On the other hand, examples in which a fatty acid having odd-numbered carbon atoms or a derivative thereof is incorporated in hair cosmetics include the compound described in Japanese Patent Publication No. 41363/1988.

However, although it is said that the above-mentioned conventional cosmetics such as the hair growth agent are effective for the prevention and improvement of dandruff, itch, hair falling out and the like and besides promote hair generation and restoring, the real situation at the present time is that cosmetics which exert satisfactory effect have never been realized.

Under such circumstances, it is a general object of the invention to provide cosmetics that are excellent in hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action and the like, thus well suited to use for hair growth, skin care, etc.

As a solution for the foregoing object, it has been found that an excellent hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action and the like are exhibited by incorporating esters of acylamino acids containing acyl groups having specifically numbered carbon atoms and that the use of such acylamino acid esters bring about the advantage of improving the solubility thereof in a solvent which is a base material for cosmetics.

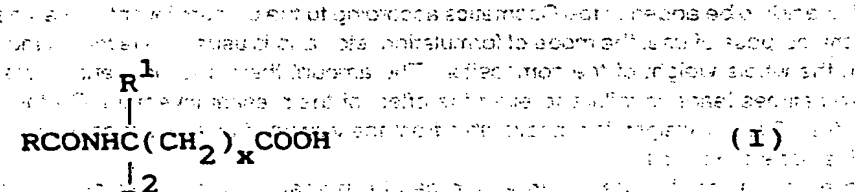
Specifically, the present invention provides cosmetics which comprise an ester of N-acylamino acids containing acyl groups having odd-numbered carbon atoms.

In the following, detailed description will be given of the present invention.

The present invention relates to cosmetics which comprise esters of N-acylamino acids containing acyl groups having odd-numbered carbon atoms. The ester of N-acylamino acids containing acyl groups having odd-numbered carbon atoms which ester is blended in cosmetics is an ester compound of an N-acylamino acid in which at least one of the amino groups in the amino acid has been acylated with an acyl group having odd-numbered carbon atoms with an alcoholic compound.

As the amino acid to be used for the production of the above-mentioned N-acylamino acids containing acyl groups having odd-numbered carbon atoms, amino acids such as an amino acid of natural origin, a non-proteinic amino acid and an amino acid produced by chemical synthesis can be used and are exemplified by an α-amino acid, β-amino acid, γ-amino acid, δ-amino acid, aliphatic amino acid, aromatic amino acid, heterocyclic amino acid, neutral amino acid, basic amino acid and acidic amino acid. There are also usable amino acids having optical isomerism such as L-, D- and racemic isomers. Specific examples of the above-mentioned amino acids inclide alanine, valine, leucine, isoleucine, methionine, tryptophan, phenylalanine, glycine, serine, threonine, cysteine, tyrosine, asparagine, glutamine, lysine, arginine, aspartic acid, glutamic acid, β-alanine, hydroxylysine, ornithine, citrulline, 5-aminolevulinic acid and γ-aminobutyric acid.

With regard to the Cosmetics of the invention, the compound represented by the general formula (I) is preferably used as a N-acylamino acid containing an acyl group having odd-numbered carbon atoms.

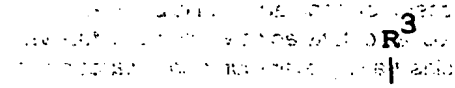


$$RCONHC(CH_2)_xCOOH \quad (I)$$

wherein R is a straight chain aliphatic hydrocarbon group having even-numbered carbon atoms which may have a substituent group; R^1 and R^2 are each a hydrogen atom, an alkyl group, a hydroxyalkyl group, an aryl group, a hydroxyaryl group, $-(CH_2)_yCOOH$ or $-(CH_2)_zNH_2$, said groups may be substituted by a carboxyl group (-COOH) or an amino group ($-NH_2$); and x, y and z are each an integer from 0 to 4.

The straight chain aliphatic hydrocarbon group having even-numbered carbon atoms represented by R in the foregoing general formula (I), which may be saturated or unsaturated, is preferably exemplified by the group $CH_3(CH_2)_n-$ wherein n is an odd integer from 5 to 17.

In the Cosmetic of the invention, the compound represented by the general formula (II) is preferably usable as the N-acylamino acid represented by the foregoing general formula (I)



$$CH_3(CH_2)_nCONHCHCOOH \qquad (II)$$

wherein R^3 is $-(CH_2)_yCOOH$ in which y and n are each as previously defined in the general formula (I).

In the present invention, a compound in which y is 1 or 2 is preferably used. As the acyl group having odd-numbered carbon atoms in the N-acylamino acid containing an acyl group having odd-numbered carbon atoms, there is preferably usable an acyl group having carbon atoms in an odd number in the range of 7 to 19, preferably 11 to 19, more preferably 13 to 17. In the case where the number of carbon atoms departs from the aforesaid range, the effect of the present invention is sometimes not sufficiently achieved. In addition, the N-acylamino acid is preferably derived from an acidic amino acid, especially from N-acylaspartic acid or N-acylglutamic acid, though the N-acylamino acid may be derived from any of an acidic amino acid, neutral amino acid and basic amino acid.

The above-mentioned N-acylamino acids containing acyl groups having odd-numbered carbon atoms can be synthesized, for example, by the condensation reaction between a higher fatty acid chloride having odd-numbered carbon atoms and an amino acid on the basis of the so called Schotten Baumann reaction or the method described in "Biochemistry" vol 35, No. 2, pp 67 to 74, 1963, Research on Polyamino Acid (I). The higher fatty acid having odd-numbered carbon atoms can be synthesized by a conventional method, specifically by the oxo process from an α-olefin having even-numbered carbon atoms and by the process using microorganism as described in Japanese Patent Application Laid-Open No. 253866/1994.

The alcoholic compound which forms an ester of the N-acylamino acid containing an acyl group having odd-numbered carbon atoms in the Cosmetics according to the present invention can be suitably selected in accordance with the purpose of use of said ester and the form of agent. Examples of usable alcoholic compounds include an alkanol and an alkandiol such as methanol, ethanol, propanol, butanol, isopropyl alcohol, tert-butyl alcohol, lauryl alcohol, myristyl alcohol, butanediol, ethylene glycol and propylene glycol, alkanpolyol such as glycerol, polyglycol such as polyethylene glycol and polypropylene glycol, sugar alcohol such as sorbitol, mannitol and dulcitol, sugar such as cane sugar, fruit sugar and glucose, sorbitan and cholesterol. Of these monohydric alcohols, polyhydric alcohols, polyethylene glycol and polypropylene glycol are preferable.

The ester of the N-acylamino acids containing acyl groups having odd-numbered carbon atoms in the Cosmetics according to the present invention can be prepared from the above-mentioned N-acylamino acids containing acyl groups having odd-numbered carbon atoms and the alcoholic compound by means of an esterification reaction, or by reacting an amino acid ester and a higher fatty acid chloride, said amino acid ester being prepared, in advance, from the amino acid and the aforesaid alcoholic compound.

The N-acylamino acid ester as mentioned above may be used alone or in combination with at least one other.

The amount of the ester of the N-acylamino acid containing an acyl group having odd-numbered carbon atoms (specific N-acylamino acid) to be added in the Cosmetics according to the present invention can be suitably determined in accordance with the purpose of use, the mode of formulation, etc., and is usually selected in the range of 0.01 to 20% by weight based on the whole weight of the compositon. The amount thereof to be blended therein, when less than 0.01% by weight, sometimes leads to failure to exert the effect of the present invention. On the contrary, the amount thereof, when more than 20% by weight, is not favorable from the viewpoint of economical efficiency since the working effect approaches the uppermost limit.

The Cosmetics according to the present invention can be prepared from esters of the aforestated specific N-acylamino acid in the presence of a solvent, when necessary. Any solvent can be used, provided that the aforesaid compound is soluble therein, and an alcoholic solvent is preferably usable from the aspect of affinity for human skin. Usable solvents are specifically exemplified by methanol, ethanol, propyl alcohol, isopropyl alcohol, glycerol, propylene

glycol, polyethylene glycol and n-paraffin.

The Cosmetics according to the present invention may be blended, at need, with another component to the extent that such blending does not impair the object of the present invention, in addition to the principal component of the ester of the specific N-acylamino acid. Such another component is suitably selected in accordance with the purpose of use, type and form of the cosmetics, and is exemplified by base materials such as distilled water, alcohols, polyhydric alcohols, surfactants, fats and oils and polysaccharides, colorants, perfumes, vitamins, amino acids, hormones, vasodilators, anti-flammatory agents, keratolytics, disinfectants and antiseptics.

The ester of the specific N-acylamino acid to be used in the present invention can be prepared into a variety of forms such as a liquid, powder, cream and paste according to the purpose of use as cosmetics. Moreover, the cosmetics can be made into a variety of marketable products such as hair growth agent, hair grooming agent, lotion, hair rinse, skin cream, detergent, dispersant, emulsifying agent, antimicrobial agent, antiseptics, ultraviolet absorbers, etc. Furthermore, the ester of the specific N-acylamino acid to be used in the present invention can expand the use to physiologically active fields such as anticancer drug and antiviral drug.

By the use of the ester of the N-acylamino acid containing an acyl group having odd-numbered carbon atoms according to the present invention, it is made possible to obtain cosmetics which have excellent hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action and the like and thus are well suited for hair growth, skin care, etc. Furthermore, the use of such ester markedly improves the solubility thereof in a solvent which is a base material of cosmetics. In the following, the present invention will be described in more detail with reference to comparative Examples and working examples.

Preparation Example 1

Synthesis of N-tridecanoyl-L-aspartic acid methyl ester ---

(1) Synthesis of tridecanoyl chloride ---

In a one L (liter) two-necked flask were placed 158.7g (0.74 mol) of tridecanoic acid and 200 milliliter (mL) of cyclohexane, and the flask was equipped with a 100 mL dropping funnel containing 83.3g (0.7 mol) of thionyl chloride and a reflux tube. Then, the tridecanoic acid was completely dissolved under heating and stirring of the flask in an oil bath at 80°C. Thereafter the thionyl chloride was added dropwise over a period of 2 hours, and further the oil bath was maintained at 80°C for one hour. From the resultant reaction solution were removed the cyclohexane and the thionyl chloride under reduced pressure by means of an aspirator. THe resultant reaction mixture was subjected to vacuum distillation. Thus 166.0g (0.71 mol) of tridecanoyl chloride was obtained in a yield of 95.9% based on the fed tridecanoic acid.

(2) Synthesis of N-tridecanoyl-L-aspartic acid ---

In a one L three-necked flask were placed 15.8g (0.12 mol) of L-aspartic acid and an aqueous solution of 9.6g (0.24 mol) of sodium hydroxide in 150 mL of water under stirring. After the L-aspartic acid was dissolved, 120 mL of acetone was added to the mixture in the flask. Then, to the resultant reaction liquid which had been cooled to 0°C were added dropwise over a period of 30 minutes, 23.3g (0.1 mol) of tridecanoyl chloride and an aqueous solution of 4g of sodium hydroxide in 30 mL of water simultaneously therewith, while maintaining the reaction temperature at 0 to 5°C and pH at 11 to 12. Thereafter, by gradually raising the temperature of the reaction liquid to room temperature (25°C) under stirring over a period of 2 hours, a solution of disodium tridecanyol-L-aspartate was obtained. To the resultant solution was added 65 mL of 5N hydrochloric acid to lower the pH of the solution to 1. The crystal thus percipitated was separated from the solution by means of vacuum filtration, washed with water and dried under reduced pressure. The resultant crystal was washed with 500 mL of hexane, dried and recrystallized from a mixed solvent of ethanol/water (3 : 7 v/v). As a result 14.4g (0.044 mol) of N-tridecanoyl-L-aspartic acid was obtained in a yield of 36.8% based on the fed tridecanoyl chloride. The physical properties of the objective N-tridecanoyl-L-aspartic acid were as follows.

^{1}H-NMR (CD_3OD); δ (ppm)

0.89 (t, 3H)
1.29 (s, 22H)
1.55 to 1.65 (m, 2H)
2.23 (t, 2H)
2.72 to 2.92 (m, 1H)
4.74 (dd, 1H)

IR (cm^{-1});

3353, 3310, 2926, 1725, 1296, 1196, 928

Elemental analysis ($C_{17}H_{31}NO_5$)			
Found	C62.15%,	H9.54%,	N4.22%
Calculated	C61.98%,	H9.48%,	N4.25%

Melting point: 117.5 to 119.7°C

(3) Synthesis of N-tridecanoyl-L-aspartic acid methyl ester

In a 200 mL two-necked flask were placed 1.02g (3.10 mmol) of N-tridecanoyl-L-aspartic acid, 20 mL of methanol to dissolve said acid and 0.5 mL of a 14% solution of boron trifluoride in methanol. The flask, which was equipped with a reflux tube, was placed in a hot water bath at 50°C to proceed with esterification at 50°C for 2 hours. The resultant reaction mixture was allowed to cool to room temperature, then incorporated with 25 mL of 50 g/L aqueous solution of sodium chloride, and extracted with 40 mL of diethyl ether. The resultant ether layer was washed with 40 mL of water and dehydrated with sodium sulfate anhydride. The resultant extract, from which the solvent was removed under reduced pressure, was dried overnight to afford crystalline reaction product. By the use of a silica-gel column chromatography of 40 mm in diameter and 110 mm in length, a first fraction was obtained by the fractionation of said reaction product with 600 mL of chloroform, and a second fraction was obtained in the same manner with 200 mL of a mixed solvent of chloroform : methanol (2 : 1200 v/v). Each of the fractions, from which the solvent was removed under reduced pressure, was dried to produce 0.38g (1.05 mmol) of N-tridecanoyl-L-aspartic acid dimethyl ester in a yield of 34% from the first fraction and 0.55g (1.61 mmol) of N-tridecanoyl-L-aspartic acid methyl ester in a yield of 52% from the second fraction.

Preparation Example 2

Synthesis of N-pentadecanoyl-L-aspartic acid methyl ester

(1) Synthesis of pentadecanoyl chloride

In a one L (liter) two-necked flask were placed 160.0g (0.66 mol) of pentadecanoic acid and 200 milliliter (mL) of cyclohexane, and the flask was equipped with a 100 mL dropping funnel containing 83.3g (0.7 mol) of thionyl chloride and a reflux tube. Then, the pentadecanoic acid was completely dissolved under heating and stirring of the flask in an oil bath at 80°C. Thereafter the thionyl chloride was added dropwise over a period of 2 hours, and further the oil bath was maintained at 80°C for one hour. From the resultant reaction mixture were removed the cyclohexane and the thionyl chloride under reduced pressure by means of an aspirator. The resultant crude reaction product was subjected to vacuum distillation. Thus 110.0g (0.42 mol) of pentadecanoyl chloride was obtained in a yield of 63.9% based on the fed pentadecanoic acid.

(2) Synthesis of N-pentadecanoyl-L-aspartic acid

In a one L three-necked flask were placed 31.9g (0.24 mol) of L-aspartic acid and an aqueous solution of 19.2g (0.48 mol) of sodium hydroxide in 150 mL of water under stirring. After the L-aspartic acid was dissolved, 120 mL of acetone was added to the mixture in the flask. Then, to the resultant reaction liquid which had been cooled to 0°C were added dropwise over a period of 30 minutes, 52.2g (0.2 mol) of pentadecanoyl chloride and an aqueous solution of 0.2N sodium hydroxide in 30 mL of water simultaneously therewith, while maintaining the reaction temperature at 0 to 5°C and pH at 11 to 12. Thereafter, by gradually raising the temperature of the reaction liquid to room temperature (25°C) under stirring over a period of 2 hours, a solution of disodium pentadecanoyl-L-aspartate was obtained. To the resultant solution was added 140 mL of 5N hydrochloric acid to lower the pH of the solution to 1. The crystal thus precipitated was separated from the solution by means of vacuum filtration, washed with water and dried under reduced pressure. The resultant crystal was washed with 500 mL of hexane, dried and recrystallized from a mixed solvent of ethanol/water (1 : 1). As a result 39.8g (0.11 mol) of N-pentadecanoyl-L-aspartic acid was obtained in a yield of 55.6% based on the fed pentadecanoyl chloride. The physical properties of the objective N-pentadecanoyl-L-asparatic acid were as follows.

^{1}H-NMR (CD_3OD); δ (ppm)

0.89 (t, 3H)
1.28 (s, 26H)
1.55 to 1.65 (m, 2H)
2.23 (t, 2H)
2.72 to 2.92 (m, 1H)
4.74 (dd, 1H)

IR (cm^{-1});
3353, 3310, 2926, 1725, 1296, 1196, 928

Elemental analysis ($C_{19}H_{35}NO_5$)			
Found	C63.10%,	H9.53%,	N4.08%
Calculated	C63.84%,	H9.87%,	N3.92%

Melting point : 122.8 to 124.0°C

(3) Synthesis of N-pentadecanoyl-L-aspartic acid methyl ester ---

In a 200 mL two-necked flask were placed 1.04g (2.91 mmol) of N-pentadecanoyl-L-aspartic acid, 20 mL of methanol to dissolve said acid and 0.5 mL of a 14% solution of boron trifluoride in methanol. The flask, which was equipped with a reflux tube, was placed in a hot water bath at 50°C to proceed with esterification at 50°C for 2 hours. The resultant reaction mixture was allowed to cool to room temperature, then incorporated with 25 mL of 50 g/L aqueous solution of sodium chloride, and extracted with 40 mL of diethyl ether. THe resultant ether layer was washed with 40 mL of water and dehydrated with sodium sulfate anhydride. The resultant extract, from which the solvent was removed under reduced pressure, was dried overnight to afford crystalline reaction product. By the use of a silica-gel column chromatography of 40 mm in diameter and 110 mm in length, a first fraction was obtained by the fractionation of said reaction product with 600 mL of chloroform, and a second fraction was obtained in the same manner with 200 mL of a mixed solvent of chloroform: methanol (20 : 1200 v/v). Each of the fractions, from which the solvent was removed under reduced pressure, was dried to produce 0.29g (0.76 mmol) of N-pentadecanoyl-L-aspartic acid dimethyl ester in a yield of 26% from the first fraction and 0.61g (1.63 mmol) of N-pentadecanoyl-L-aspartic acid methyl ester in a yield of 56% from the second fraction.

Preparation Example 3

Synthesis of N-heptadecanoyl-L-aspartic acid methyl ester ---

(1) Synthesis of heptadecanoyl chloride ---

In a one L (liter) two-necked flask were placed 102.1g (0.38 mol) of heptadecanoic acid and 200 milliliter (mL) of cyclohexane, and the flask was equipped with a 100 mL dropping funnel containing 67.3g (0.57 mol) of thionyl chloride and a reflux tube. Then, the heptadecanoic acid was completely dissolved under heating and stirring of the flask in an oil bath at 80°C. Thereafter the thionyl chloride was added dropwise over a period of 2 hours, and further the oil bath was maintained at 80°C for one hour. From the resultant reaction mixture were removed the cyclohexane and the thionyl chloride under reduced pressure by means of an aspirator. The resultant reaction mixture was subjected to vacuum distillation. Thus 88.5g (0.31 mol) of heptadecanoyl chloride was obtained in a yield of 81.2% based on the fed heptadecanoic acid.

(2) Synthesis of N-heptadecanoyl-L-aspartic acid ---

In a one L three-necked flask were placed 16.0g (0.12 mol) of L-aspartic acid and an aqueous solution of 9.6g (0.24 mol) of sodium hydroxide in 150 mL of water under stirring. After the L-aspartic acid was dissolved, 120 mL of acetone was added to the mixture in the flask. Then, to the resultant reaction liquid which had been cooled to 0°C were added dropwise over a period of 30 minutes, 29.0g (0.1 mol) of heptadecanoyl chloride and an aqueous solution of 4g sodium hydroxide in 30 mL of water, while maintaining the reaction temperature at 0 to 5°C and pH at 11 to 12. Thereafter, by gradually raising the temperature of the reaction liquid to room temperature (25°C) under stirring over a period of 2 hours, a solution of disodium heptadecanoyl-L-aspartate was obtained. To the resultant solution was added 65 mL of

5N hydrochloric acid to lower the pH of the solution to 1. The crystal thus precipitated was separated from the solution by means of vacuum filtration, washed with water and dried under reduced pressure. The resultant crystal was washed with 500 mL of hexane, dried and recrystallized from a mixed solvent of ethanol/water (8 : 1). As a result 21.0g (0.054 mol) of N-heptadecanoyl-L-aspartic acid was obtained in a yield of 54.3% based on the fed heptadecanoyl chloride. The physical properties of the objective N-heptadecanoyl-L-aspartic acid were as follows.

^{1}H-NMR (CD_3OD); δ (ppm)
0.89 (t, 3H)
1.28 (s, 30H)
1.55 to 1.65 (m, 2H)
2.23 (t, 2H)
2.72 to 2.92 (m, 1H)
4.74 (dd, 1H)
IR (cm^{-1});
3353, 3310, 2926, 1725, 1296, 1196, 928

Elemental analysis ($C_{21}H_{39}NO_5$)			
Found	C65.34%,	H10.07%,	N3.85%
Calculated	C65.42%,	H10.20%,	N3.63%

Melting point : 126.4 to 128.5°C

(3) Synthesis of N-heptadecanoyl-L-aspartic acid methyl ester

In a 200 mL two-necked flask were placed 1.10g (2.85 mmol) of N-heptadecanoyl-L-aspartic acid, 20 mL of methanol to dissolve said acid and 0.5 mL of a 14% solution of boron trifluoride in methanol. The flask, which was equipped with a reflux tube, was placed in a hot water bath at 50°C to proceed with esterification at 50°C for 2 hours. The resultant reaction mixture was allowed to cool to room temperature, then incorporated with 25 mL of 50 g/L aqueous solution of sodium chloride, and extracted with 40 mL of diethyl ether. The resultant ether layer was washed with 40 mL of water and dehydrated with sodium sulfate anhydride. The resultant extract, from which the solvent was removed under reduced pressure, was dried overnight to afford crystalline reaction product. By the use of a silica-gel column chromatography of 40 mm in diameter and 110 mm in length, a first fraction was obtained by the fractionation of said reaction product with 600 mL of chloroform, and a second fraction was obtained in the same manner with 200 mL of a mixed solvent of chloroform: methanol (2 : 1200 v/v). Each of the fractions, from which the solvent was removed under reduced pressure, was dried to produce 0.27g (0.66 mmol) of N-heptadecanoyl-L-aspartic acid dimethyl ester in a yield of 23% from the first fraction and 0.70g (1.74 mmol) of N-heptadecanoyl-L-aspartic acid methyl ester in a yield of 61% from the second fraction.

Examples 1 to 14 and Comparative Examples 1 to 3

A group of eight male mice aged 8 weeks of C_3H series with a body weight of 18 to 24g were each subjected to depilation at a back portion thereof in about 2 X 3.5 cm size. Then 1% by weight solution of any of the N-acylamino acid compounds in ethanol as shown in Table 3 as a sample to be tested was applied to the depilated back portion once a day in an amount of 0.1 mL over a period of 3 weeks to observe the fur growth state. An evaluation was made of the fur growth effect by visually observing the state of trichogenous promotion in the area to be tested in comparison with the back portion coated only with ethanol on the basis of the following evaluation criterion (see Remarks under Table 1). The results are given in Table 1. According to the results, favorable fur growth effect was recognized in the esters of N-acylamino acids each containing an acyl group having odd-numbered carbon atoms. In addition, no influence by the coating of the samples to be tested was recognized throughout the testing period with regard to general symptom, dermal state and change in body weight. The acylamino acid ester compounds used in this test were those synthesized in Preparation Examples 1 to 3 or mutatis mutandis according therto.

Table 1

	N-acylamino acid ester	Evaluation
Example 1	N-pentadecanoylaspartic acid methyl ester	◎
Example 2	N-tridecanoylaspartic acid methyl ester	○
Example 3	N-heptadecanoylaspartic acid methyl ester	○
Example 4	N-pentadecanoylaspartic acid dimethyl ester	◎
Example 5	N-pentadecanoylaspartic acid ethyl ester	◎
Example 6	N-pentadecanoylaspartic acid isopropyl ester	◎
Example 7	N-pentadecanoylaspartic acid hexadecyl ester	○
Example 8	N-pentadecanoylaspartic acid ethylene glycol ester	○
Example 9	N-pentadecanoylaspartic acid polyethylene glycol (n=6) ester	○
Example 10	N-tridecanoylglutamic acid methyl ester	○
Example 11	N-pentadecanoylvaline methyl ester	○
Example 12	N-pentadecanoylthreonine methyl ester	○
Example 13	N-pentadecanoylphenylalamine ethyl ester	○
Example 14	N-pentadecanoyllysine methyl ester	○
Comp. * Example 1	N-dodecanoylaspartic acid methyl ester	X
Comp. * Example 2	N-myristoylaspartic acid	X
Comp. * Example 3	N-dodecanoylglutamic acid methyl ester	X

[Remarks]
◎ Strong trichogenous promotion
○ intermediate trichogenous promotion
△ slight trichogenous promotion
X trichogenous promotion unobserved

*Comp. means "Comparative"

In the following, a variety of cosmetics along with forms and chemical compositions are given as additional examples according to the present invention.

Example 15 Hair grooming agent

	% by weight
Ethanol	75.0
N-pentadecanoylasparatic acid methyl ester	4.0
Olive oil	1.0
α-Tocopherol	0.5
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Example 16 Hair grooming agent

	% by weight
Ethanol	60.0
N-tridecanoylglutamic acid methyl ester	3.0
Isopropyl myristate	2.0
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Example 17 Hair tonic

	% by weight
Ethanol	60.0
N-pentadecanoylasparatic acid methyl ester	1.0
Tocopherol acetate	0.5
Glycerol	3.0
L-menthol	0.1
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Example 18 Hair rinse

	% by weight
Cetyltrimethylammonium chloride	2.0
Polyoxyethylene cetyl ether	1.0
Cetyl alcohol	2.0
N-tridecanoyllysine methyl ester	1.0
Propylene glycol	5.0
Perfume	proper amount
Purified water	balance

Example 19 Foundation

	% by weight
Stearic acid	2.0
Liquid lanolin	2.0
Liquid paraffin	3.0
N-tridecanoylvaline methyl ester	2.0
Isopropyl myristate	5.0
Sorbitan monooleate	2.0
Titanium oxide	8.0
Talc	4.0
Bentonite	0.5
Iron oxide red	0.5
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Example 20 Lipstick

	% by weight
Titanium oxide	1.0
Rose Bengal	4.0
Castor oil	50.0
Octyl dodecanol	10.0
N-tridecanoylleucine methyl ester	5.0
Beeswax	5.0
Carnauba wax	5.0
Solid paraffin	20.0
Perfume	proper amount
Antiseptics	proper amount

Example 21 Lotion

	% by weight
Ethanol	15.0
Polyethylene glycol	3.0
N-pentadecanoylthreonine methyl ester	1.0
Polyoxyethylene sorbitan monolaurate	2.0
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Example 22 Vanishing cream

	% by weight
Stearic acid	15.0
Petrolatum	2.0
N-pentadecanoylasparatic acid dimethyl ester	1.0
Polyoxyethylene sorbitan monostearate	2.0
Sorbitan monostearate	2.0
Propylene glycol	10.0
Perfume	proper amount
Antiseptics	proper amount
Purified water	balance

Claims

1. Cosmetics which comprise an ester of N-acylamino acids containing acyl groups having odd-numbered carbon atoms.

2. The cosmetics according to Claim 1, wherein the ester of the N-acylamino acids containing acyl groups having odd-numbered carbon atoms is derived from amino acids selected from the group consisting of alanine, valine, leucine, isoleucine, methionine, tryptophan, phenylalanine, glycine, serine, threonine, cysteine, tyrosine, asparagine, glutamine, lysine, arginine, aspartic acid, glutamic acid, β-alanine, hydroxy-lysine, ornithine, citrulline, 5-aminolevulinic acid and γ-aminobutyric acid.

3. The cosmetics according to Claim 1, wherein the ester of the N-acylamino acids containing acyl groups having odd-numbered carbon atoms is derived from acidic amino acids.

4. The cosmetics according to Claim 3, wherein the acidic amino acids are each glutamic acid or aspartic acid.

5. The cosmetics according to any of claims 1 to 4, wherein the ester of the N-acylamino acids containing acyl groups having odd-numbered carbon atoms is derived, as its alcohol component, by the use of a mono-or-poly-hydric aliphatic alcohol, polyethylene glycol or polypropylene glycol.

6. The cosmetics according to any of claims 1 to 5, wherein the acyl groups having odd-numbered carbon atoms each have carbon atoms in an odd number in the range of 7 to 19.

7. An ester of an N-acylamino acid containing an acyl group having carbon atoms in an odd number in the range of 13 to 17.

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(54) Cosmetics comprising an n-acylamino acid ester

(57) There are disclosed cosmetics which comprise esters of N-acylamino acids containing acyl groups having odd-numbered carbon atoms, and esters of N-acylamino acids containing acyl groups having carbon atoms in an odd number in the range of 13 to 17. The above esters are used for the foregoing cosmetics, which have excellent hair growth promoting effect, humectant action, subcutaneous blood flow rate increasing action, etc. and thus are well suited for hair growth, skin care and the like.

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	17 April 2000	Beyss, E

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